

Patent Abstracts of Japan

PUBLICATION NUMBER : 04062974
PUBLICATION DATE : 27-02-92

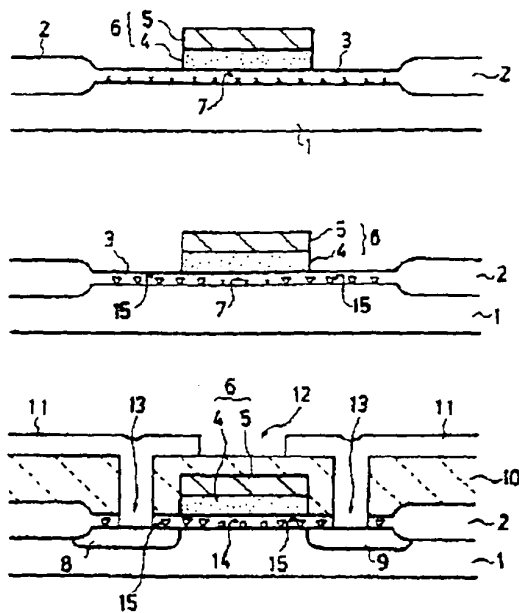
APPLICATION DATE : 30-06-90
APPLICATION NUMBER : 02173611

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INT.CL. : H01L 29/784 H01L 21/283 H01L 21/316

TITLE : MOS FIELD-EFFECT TRANSISTOR
AND MANUFACTURE THEREOF



ABSTRACT : PURPOSE: To arrange that hydrogen-terminated silicon atoms are hardly returned to an interface level by hot electrons generated during an operation and to stabilize an operating characteristic by a method wherein silicon atoms bonded to halogen atoms are contained in a gate oxide film near a drain region.

CONSTITUTION: A gate electrode 6 is formed; and after that, it is heat-treated in an atmosphere of a mixed gas of a halogen element, e.g. chlorine Cl_2 , oxygen O_2 and nitrogen N_2 . The chlorine creeps from the surface of a gate oxide film 3; it is diffused into the gate oxide film 3; and it is bonded to interface-level silicon atoms 7 near the boundary between the gate oxide film 3 and a silicon substrate 1. As a result, bonding pairs of silicon atoms having no bonding partner are terminated at the chlorine and are changed to chlorine-terminated silicon atoms 15. Since the bonding strength of chlorine atoms Cl to silicon atoms Si is stronger than the bonding strength of hydrogen atoms H to silicon atoms Si, their bonded state is not detached by hot electrons. Consequently, electrons during an operation are not scattered and an operating characteristic is not worsened.

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